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John C. Stennis Space Center PROCEDURE FOR GTAW OF 625 ALLOY TO 300 SERIES STAINLESS STEEL

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Stennis Standard	SSTD-8070-0122-WELD	B
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Page 2 of 20		
Responsible Office: NASA Center Operations Directorate Operations & Maintenance Division		
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Document History Log

Status/ Change/ Revision	Change Date	Originator/ Phone	Description
Basic	9/4/02	L. de Quay 8-1956	Initial Release
A	6/16/09	D. Dike 8-2803	Changed Scope section to Purpose and added Applicability section. Updated references throughout document. Added section for abbreviations and acronyms in document. Updated attached WPS, including Figure 1.
B	9/29/14	D. Dike 8-2803	Five-year revision. Updated references and acronyms. In section 5.2, added UNS N26010 and 26625 to the list of base metals for which this welding procedure may be used. Updated the ASME P-43 and ASME P-8 base metals listings of section 5.2.

Stennis Standard	SSTD-8070-0122-WELD	B
	<i>Number</i>	<i>Rev.</i>
	Effective Date: September 29, 2014	
	Review Date: September 29, 2019	
		Page 3 of 20
Responsible Office: NASA Center Operations Directorate Operations & Maintenance Division		
SUBJECT: Procedure for GTAW of 625 Alloy to 300 Series Stainless Steel		

Table of Contents

1.0	PURPOSE	4
2.0	APPLICABILITY	4
3.0	REFERENCES AND APPLICABLE DOCUMENTS	4
4.0	RESPONSIBILITIES	9
5.0	REQUIREMENTS AND PROCEDURES	9
	5.1 General.....	9
	5.2 Specification Compliances.....	10
6.0	RECORDS AND FORMS.....	11
7.0	ABBREVIATIONS AND ACRONYMS.....	11
8.0	ATTACHMENTS	13
	8.1 QW-482 Suggested format for WPS.....	14
	8.2 QW-482 WPS 8070-0122-WELD Figure 1.....	16
	8.3 QW-483 Suggested format for PQR.....	17
	8.4 Certificate of Analysis, Report No. 341-2 (May 28, 2002)	19

Stennis Standard	SSTD-8070-0122-WELD	B
	<i>Number</i>	<i>Rev.</i>
	Effective Date: September 29, 2014	
	Review Date: September 29, 2019	
Page 4 of 20		
Responsible Office: NASA Center Operations Directorate Operations & Maintenance Division		
SUBJECT: Procedure for GTAW of 625 Alloy to 300 Series Stainless Steel		

1.0 PURPOSE

This John C. Stennis Space Center (SSC) standard (SSTD) provides a qualified American Society of Mechanical Engineers (ASME) weld procedure for Gas Tungsten Arc Welding (GTAW) of 625 Alloy (UNS N06625) to 300 Series Stainless Steel at SSC.

2.0 APPLICABILITY

This SSTD is applicable when welding is to be performed to the requirements of ASME Boiler and Pressure Vessel Code (BPVC) Section VIII, ASME Piping Code B31.3, or other codes, as required by Engineering.

3.0 REFERENCES AND APPLICABLE DOCUMENTS

All references are assumed to be the latest version unless otherwise indicated.

ASME Boiler and Pressure Vessel Code, Section II, *Materials*

ASME Boiler and Pressure Vessel Code, Section IX, *Welding, Brazing and Fusing Qualifications*

ASME B31.3, *Process Piping*

ASTM A182, *Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service*

ASTM A213, *Standard Specification for Seamless Ferritic and Austenitic Alloy-Steel Boiler, Superheater, and Heat-Exchanger Tubes*

ASTM A240, *Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications*

ASTM A249, *Standard Specification for Welded Austenitic Steel Boiler, Superheater, Heat-Exchanger, and Condenser Tubes*

ASTM A269, *Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service*

ASTM A270, *Standard Specification for Seamless and Welded Austenitic and Ferritic/Austenitic Stainless Steel Sanitary Tubing*

ASTM A276, *Standard Specification for Stainless Steel Bars and Shapes*

ASTM A312, *Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes*

ASTM A314, *Standard Specification for Stainless Steel Billets and Bars for Forging*

ASTM A351, *Standard Specification for Castings, Austenitic, for Pressure-Containing Parts*

ASTM A358, *Standard Specification for Electric-Fusion-Welded Austenitic Chromium-Nickel Stainless Steel Pipe for High-Temperature Service and General Applications*

ASTM A376, *Standard Specification for Seamless Austenitic Steel Pipe for High-Temperature Service*

Stennis Standard	SSTD-8070-0122-WELD	B
	Number	Rev.
	Effective Date: September 29, 2014	
	Review Date: September 29, 2019	
	Page 5 of 20	
Responsible Office: NASA Center Operations Directorate Operations & Maintenance Division		
SUBJECT: Procedure for GTAW of 625 Alloy to 300 Series Stainless Steel		

ASTM A403, *Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings*
 ASTM A409, *Standard Specification for Welded Large Diameter Austenitic Steel Pipe for Corrosive or High-Temperature Service*
 ASTM A451, *Standard Specification for Centrifugally Cast Austenitic Steel Pipe for High-Temperature Service*
 ASTM A473, *Standard Specification for Stainless Steel Forgings*
 ASTM A479, *Standard Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels*
 ASTM A480, *Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip*
 ASTM A484, *Standard Specification for General Requirements for Stainless Steel Bars, Billets, and Forgings*
 ASTM A511, *Standard Specification for Seamless Stainless Steel Mechanical Tubing*
 ASTM A554, *Standard Specification for Welded Stainless Steel Mechanical Tubing*
 ASTM A632, *Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing (Small-Diameter) for General Service*
 ASTM A666, *Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar*
 ASTM A688, *Standard Specification for Seamless and Welded Austenitic Stainless Steel Feedwater Heater Tubes*
 ASTM A743, *Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application*
 ASTM A744, *Standard Specification for Castings, Iron-Chromium-Nickel, Corrosion Resistant, for Severe Service*
 ASTM A774, *Standard Specification for As-Welded Wrought Austenitic Stainless Steel Fittings for General Corrosive Service at Low and Moderate Temperatures*
 ASTM A778, *Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products*
 ASTM A793, *Standard Specification for Rolled Floor Plate, Stainless Steel*
 ASTM A813, *Standard Specification for Single- or Double-Welded Austenitic Stainless Steel Pipe*
 ASTM A814, *Standard Specification for Cold-Worked Welded Austenitic Stainless Steel Pipe*
 ASTM A908, *Standard Specification for Stainless Steel Needle Tubing*
 ASTM A943, *Standard Specification for Spray-Formed Seamless Austenitic Stainless Steel Pipes*
 ASTM A959, *Standard Guide for Specifying Harmonized Standard Grade Compositions for Wrought Stainless Steels*
 ASTM A965, *Standard Specification for Steel Forgings, Austenitic, for Pressure and High Temperature Parts*
 ASTM A988, *Standard Specification for Hot Isostatically-Pressed Stainless Steel Flanges, Fittings, Valves, and Parts for High Temperature Service*

Stennis Standard	SSTD-8070-0122-WELD	B
	Number	Rev.
	Effective Date: September 29, 2014	
	Review Date: September 29, 2019	
	Page 6 of 20	
Responsible Office: NASA Center Operations Directorate Operations & Maintenance Division		
SUBJECT: Procedure for GTAW of 625 Alloy to 300 Series Stainless Steel		

ASTM B366, *Standard Specification for Factory-Made Wrought Nickel and Nickel Alloy Fittings*

ASTM B443, *Standard Specification for Nickel-Chromium-Molybdenum-Columbium Alloy (UNS N06625) and Nickel-Chromium-Molybdenum-Silicon Alloy (UNS N06219) Plate, Sheet, and Strip*

ASTM B444, *Standard Specification for Nickel-Chromium-Molybdenum-Columbium Alloys (UNS N06625 and UNS N06852) and Nickel-Chromium-Molybdenum-Silicon Alloy (UNS N06219) Pipe and Tube*

ASTM B446, *Standard Specification for Nickel-Chromium-Molybdenum-Columbium Alloy (UNS N06625), Nickel-Chromium-Molybdenum-Silicon Alloy (UNS N06219), and Nickel-Chromium-Molybdenum-Tungsten Alloy (UNS N06650) Rod and Bar*

ASTM B564, *Standard Specification for Nickel Alloy Forgings*

ASTM B704, *Standard Specification for Welded UNS N06625, UNS N06219 and UNS N08825 Alloy Tubes*

ASTM B705, *Standard Specification for Nickel-Alloy (UNS N06625, N06219 and N08825) Welded Pipe*

ASTM B751, *Standard Specification for General Requirements for Nickel and Nickel Alloy Welded Tube*

ASTM B775, *Standard Specification for General Requirements for Nickel and Nickel Alloy Welded Pipe*

ASTM B829, *Standard Specification for General Requirements for Nickel and Nickel Alloys Seamless Pipe and Tube*

ASTM B834, *Standard Specification for Pressure Consolidated Powder Metallurgy Iron-Nickel-Chromium-Molybdenum (UNS N08367) and Nickel-Chromium-Molybdenum-Columbium (Nb) (UNS N06625) Alloy Pipe Flanges, Fittings, Valves, and Parts*

ASTM B924, *Standard Specification for Seamless and Welded Nickel Alloy Condenser and Heat Exchanger Tubes With Integral Fins*

ASTM F899, *Standard Specification for Wrought Stainless Steels for Surgical Instruments*

MIL-C-24707, *Castings, Ferrous, General Specification For*

MIL-DTL-23195, *Steel Bars and Forgings, Corrosion Resistant, Austenitic (UNS S30400, S30403, S31600, S31603, S34700, and S34800)*

MIL-DTL-23196, *Steel Plate, Corrosion Resistant, Austenitic (UNS S30400, UNS S30403, S31600, S34700, and S34800)*

MIL-E-21562E, *Electrodes and Rods - Welding, Bare, Nickel Alloy*

MIL-T-8504, *Tubing, Steel, Corrosion-Resistant (304), Aerospace Vehicle Hydraulic Systems, Annealed, Seamless and Welded (Not for New Design)*

SAE AMS 5401, *Nickel Alloy, Corrosion and Heat-Resistant, Investment Castings 62Ni - 21.5Cr - 9.0Mo - 3.6Cb (Nb) Vacuum Melted, Vacuum Cast As Cast - UNS N26625*

SAE AMS 5402, *Nickel Alloy, Corrosion and Heat-Resistant, Investment Castings 62Ni - 21.5Cr - 9.0Mo - 3.6Cb (Nb) As Cast - UNS N26010*